

We claim:

1. A ballistic laminate structure in sheet form, comprising:
  - (a) a first high-performance unifabric composite including an array of unidirectionally-oriented fiber bundles carried on a fiber-stabilizing scrim and having a tensile strength greater than 7 grams per denier;
  - (b) a second high-performance unifabric composite including an array of high performance, unidirectionally-oriented fiber bundles carried on a fiber-stabilizing scrim and having a tensile strength greater than 7 grams per denier; and
  - (c) said first and second unifabric composites being cross-plyed at an angle and bonded together to form said ballistic laminate structure.
2. A ballistic laminate structure according to claim 1, wherein said scrim comprises a nonwoven adhesive web.
3. A ballistic laminate structure according to claim 1, and comprising a polymeric film residing between said first and second cross-plyed unifabric composites to adhere said composites together without substantial penetration of said film into said fiber bundles.

4. A ballistic laminate structure according to claim 1, wherein said polymeric film comprises polyethylene film having a thickness of about 0.35 mils.
5. A ballistic laminate structure according to claim 1, wherein said first unifabric composite is cross-ply at an angle of 90 degrees to said second unifabric composite.
6. A ballistic laminate structure according to claim 1, wherein the percentage by weight of the high performance fibers in the ballistic laminate structure is at least 80 percent of the total weight of the ballistic laminate structure.
7. A ballistic laminate structure according to claim 1, wherein the fiber bundles of said first and second unifabric composites comprise fibers chosen from the group consisting of aramid fiber, polyolefin, vinylon, and liquid crystal polymer-based fiber.
8. A ballistic laminate structure according to claim 1, wherein the fiber bundles of said first and second unifabric composites comprise fibers chosen from the group consisting of extended chain ultra-high molecular weight polyethylene (UHMWPE), poly {p-phenylene-2, 6-benzobisoxazole} (PBO), and poly {diimidazo pyridinylene (dihydroxy) phenylene} (M5).

9. A ballistic laminate structure according to claim 1, wherein said first unifabric composite comprises a second scrim located on an opposite side of said fiber bundles.

10. A ballistic laminate structure according to claim 1, wherein said second unifabric composite comprises a second scrim located on an opposite side of said fiber bundles.

11. A ballistic laminate structure in sheet form, comprising:

(a) a first high-performance unifabric composite including an array of unidirectionally-oriented fiber bundles sandwiched between first and second fiber-stabilizing scrims, and having a tensile strength greater than 7 grams per denier;

(b) a second high-performance unifabric composite including an array of high performance, unidirectionally-oriented fiber bundles sandwiched between first and second scrims, and having a tensile strength greater than 7 grams per denier; and

(c) said first and second unifabric composites being cross-plyed at an angle and bonded together to form said ballistic laminate structure.

12. A high-performance unifabric composite adapted for incorporation in a sheet-form ballistic laminate structure, said unifabric composite comprising an array of unidirectionally-oriented fiber bundles carried on a fiber-stabilizing scrim and having a tensile strength greater than 7 grams per denier.
13. A high-performance unifabric composite according to claim 12, and comprising a second fiber-stabilizing scrim located on an opposite side of said unidirectionally-oriented fiber bundles.
14. A high-performance unifabric composite according to claim 12, wherein said unidirectionally-oriented fiber bundles comprise fibers chosen from the group consisting of aramid fiber, polyolefin, vinylon, and liquid crystal polymer-based fiber.
15. A high-performance unifabric composite according to claim 12, wherein said unidirectionally-oriented fiber bundles comprise fibers chosen from the group consisting of extended chain ultra-high molecular weight polyethylene (UHMWPE), poly {p-phenylene-2, 6-benzobisoxazole} (PBO), and poly {diimidazo pyridinylene (dihydroxy) phenylene} (M5).

16. A high-performance unifabric composite according to claim 12, said scrim comprises a nonwoven adhesive web.

17. A high-performance unifabric composite according to claim 12, and comprising a polymeric film residing between said scrim and said unidirectionally-oriented fiber bundles to adhere said composite together without substantial penetration of said film into said fiber bundles.

18. A high-performance unifabric composite according to claim 12, wherein said polymeric film comprises polyethylene film having a thickness of about 0.35 mils.